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[54] **COMBINED THERMAL ANALYZER AND X-RAY DIFFRACTOMETER**

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[52] **U.S. Cl.** **378/80;** 378/71

[58] **Field of Search** 378/70, 71, 80; 374/31, 374/33, 34

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[57] **ABSTRACT**

Scientific apparatus and a method are described for observing simultaneously both structural and thermodynamic properties of materials. An X-ray diffractometer and a thermal analyzer and mounted to cooperate and coact on the same sample and to complete a meaningful analysis in a very few minutes. The diffractometer is equipped with a rapid position-sensitive detector connected to a multichannel analyzer to record and display X-ray diffraction data from the sample over an angle of 20°·(two theta) or more. The thermal analyzer is preferably a differential scanning calorimeter. By correlating X-ray diffraction and thermal data taken simultaneously while the sample is passing through a range of temperatures and/or environments, structural changes corresponding to thermal events can be identified and elucidated.

9 Claims, 14 Drawing Sheets